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EXAMINER	
RIVELL, JOHN A	
ART UNIT	**PAPER NUMBER**
3753	

DATE MAILED: 12/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/624,174	TALASKI, EDWARD J.	
	Examiner	Art Unit	
	John Rivell	3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/24/05 (amendment)*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Applicant's arguments filed October 24, 2005 have been fully considered but they are not persuasive.

Claims 1-26 remain pending.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6, 7, 9, 1, 12-15, 17, 18, 20-22 and 24-26 are rejected under 35 U.S.C. §102 (b) as being anticipated by Carr.

The patent to Carr, in figures 5 and 6 for example, discloses a "pressure control valve, comprising: a valve body (at 25) having a valve bore (26, 30) with a valve seat (28) and a longitudinal axis, the valve bore (at 30) having at least one surface (29) with a diameter that increases non-uniformly from its upstream end closest to the valve seat (28) to its downstream end (surface 29 is a "smoothly curved expanding diameter surface" column 3, lines 65-68); a valve head (27) received at least in part in the valve bore (30), yieldably biased (by a spring 40) to a closed position against the valve seat (28), and being movable to open positions spaced from the valve seat (28) against the bias (of spring 40) to regulate the pressure of fluid flowing through the valve bore (26, 30) downstream of the valve head (27); adjacent surfaces of the valve head (27) and the valve bore (30) between which the fluid flows being configured to define an interface angle at least when the valve head (27) is displaced from the valve seat (28), the interface angle being defined between said longitudinal axis and an interface line

intersecting a point on the valve head (27) surface closest to the valve bore (along surface 29) surface and a point of the valve bore (along surface 29) surface closest to the valve head (27) surface so that the interface angle increases as the valve head (27) is increasingly displaced from the valve seat (28)" as recited in claim 1.

Regarding claim 2, in Carr, "a spring (40 is) yieldably biasing the valve head (27) against the valve seat (28), the spring (40) being disposed downstream of the valve head (27) such that increasing displacement of the valve head (27) away from the valve seat (28) causes increasing displacement of the spring (400" as recited.

Regarding claim 3, in Carr, "the valve bore (along surface 29) has a concave portion with a diameter that increases non-linearly as the concave portion extends downstream" as recited.

Regarding claim 4, in Carr, " the concave portion (of surface 29) is generally arcuate" as recited.

Regarding claim 6, in Carr, "the valve head (27) is a spherical valve ball having a diameter that is greater than the diameter of the valve bore (26) in the area of the valve seat (28)" as recited.

Regarding claim 7, in Carr, "the interface line intersects the center of the valve ball (27) and the location of the valve bore (along surface 29) closest to the valve ball (27)" as recited.

Regarding claim 9, in Carr, "the spring (40) is a coil spring having a spring rate and increased displacement of the valve head (27) away from the valve seat (28) causes an increase in the force of the spring (40) acting on the valve head (27), the

valve bore (at surface 29) being constructed so that the interface angle increases as a function of the spring rate of the spring (40)" as recited.

Regarding claim 10, in Carr, "the interface angle increases as a function of the spring rate of the spring (40) to offset the increased spring force that acts on the valve head (27) as the valve head (27) is increasingly displaced from the valve seat (28)" as recited.

Regarding claim 12, the patent to Carr discloses a "pressure control valve, comprising: a valve body (25) having a valve bore (26, 30) with a valve seat (28) and a longitudinal axis, the valve bore (at 30) having at least one surface (at 29; surface 29 is a "smoothly curved expanding diameter surface" column 3, lines 65-68) with a diameter that increases non-uniformly from its upstream end closest to the valve seat (28) to its downstream end; and a valve ball (27) having a surface, yieldably biased (by spring 40) to a closed position against the valve seat (28), and being movable against the bias (of spring 40) to open positions spaced from the valve seat (28) to regulate the pressure of fluid flowing through the valve bore downstream of the valve ball (27); and the surfaces of the valve bore (29) and the valve head (27) are configured to define an interface angle between said longitudinal axis and a line intersecting a center of the valve ball (27) and the location of the valve bore (along surface 29) surface closest to the valve ball (27) surface, and said interface angle increases as the valve ball (27) is increasingly displaced from the valve seat (28)" as recited.

Regarding claim 13, in Carr, "a spring (40 is) yieldably biasing the valve ball (27) against the valve seat (28), the spring (40) being disposed downstream of the valve ball

(27) such that increasing displacement of the valve ball (27) away from the valve seat (28) causes increasing displacement of the spring (40)" as recited.

Regarding claim 14, in Carr, "the valve bore (along surface 29) has a concave portion with a diameter that increases non-linearly as the concave portion extends downstream" as recited.

Regarding claim 15, in Carr, "the concave portion (along surface 19) is generally arcuate" as recited.

Regarding claim 17, in Carr, "the spring (40) is a coil spring having a spring rate wherein increased displacement of the valve head (27) away from the valve seat (28) causes an increase in the force of the spring (40) acting on the valve head (27), the valve bore (along surface 29) being constructed so that the interface angle increases as a function of the spring rate of the spring (40)' as recited.

Regarding claim 18, in Carr, "the interface angle increases as a function of the spring rate of the spring (40) to offset the increased spring force that acts on the valve head (27) as the valve head (27) is increasingly displaced from the valve seat (28)" as recited.

Regarding claim 20, the patent to Carr discloses a "pressure control valve, comprising: a valve body (25) having a valve bore (26, 30) through which a fluid may flow, the valve bore having a valve seat (28), a longitudinal axis and at least one surface (29) with a diameter that increases non-uniformly from its upstream end closest to the valve seat (28) to its downstream end; a valve ball (27) having a surface, yieldably biased (by spring 40) to a closed position against the valve seat (28), and being

movable against the bias (of spring 40) to open positions spaced from the valve seat (28) to regulate the pressure of fluid flowing through the valve bore (along surface 29) downstream of the valve ball (27); and the surfaces of the valve bore (30) and the valve ball (27) are configured to provide *(it is noted that the above underlined portion of claim 20 is new to claim 20 relative to claim 20 as originally filed. That is, this addition to claim 20 is not properly indicated as per 37 CFR 1.121.)* for a given position of the valve ball (27) relative to the valve seat (28) an effective surface area of the valve ball (27) acted upon by the fluid tending to displace the ball (27) in a direction away from the valve seat (28), and the effective surface area of the valve ball (27) that is acted upon by the fluid increases as the valve ball (27) is increasingly displaced away from the valve seat (28)" as recited.

Regarding claim 21, in Carr, "the effective surface area of the valve ball (27) that is acted on by the fluid is a function of an interface angle defined between the longitudinal axis of the valve bore (at bore 26) and an interface line that defines the shortest distance between the valve ball (27) and the valve bore (along surface 29), and said interface angle increases as the valve ball (27) is increasingly displaced from the valve seat (28)" as recited.

Regarding claim 22, in Carr, "the non-uniform portion (29) of the valve bore is generally arcuate" as recited.

In the act of making, assembling and/or using the device of Carr, one necessarily performs a "method of making a pressure control valve, comprising the steps of: forming a valve bore (26, 30) in a valve body (25) so that the valve bore has a longitudinal axis,

a valve seat (28) and at least one non-uniform surface (29) with a diameter that increases as the non-uniform surface (29) extends away from the valve seat (28); inserting a valve ball (27) into the valve bore, the valve ball (27) having surface with a diameter greater than the diameter of the valve bore (at bore 16) in the area of the valve seat (28) but less than the diameter of the valve bore (along surface 29) in the area of the non-uniform surface (29) of the valve bore; inserting a spring (40) at least partially in the valve bore so that one end of the spring can engage and yieldably bias the valve ball (27) toward the valve seat (28); and configuring the surfaces of the valve bore (29) and the valve head (27) so that at least when the valve ball (27) is displaced from the valve seat (28), an interface angle is defined between the longitudinal axis and an interface line intersecting a point on the valve head (27) surface closest to the valve bore (along surface 29) surface and a point of the valve bore (along surface 29) surface closest to the valve head (27) surface, and said step of forming the valve bore (at 29) includes forming the non-uniform surface (29) of the valve bore so that the interface angle increases as the valve head (27) is increasingly displaced from the valve seat (28) to regulate the pressure of flowing fluid downstream of the valve head (27)" as recited in claim 24.

Regarding claim 25, in the act of making, assembling and/or using the device of Carr, one necessarily further performs a method "wherein the step of forming the valve bore (26, 30) including forming the non-uniform portion (29) of the valve bore so that the interface angle increases as the valve head (27) is increasingly displaced from the valve seat (28), is performed by calculating (in the act of engineering the valve as desired) the

spring force at various positions of the valve ball (27) spaced from the valve seat (28), determining an effective surface area of the valve ball (27) on which a fluid at a predetermined pressure needs to act to offset the spring (40) force at each position of the valve ball (27) as desired, determining the interface angle that corresponds to each determined effective surface area for each position of the valve ball (27), and then forming the valve bore (29) with a shape that provides the determined interface angle at each position of the valve ball" in order to function as desired.

Regarding claim 26, in the act of making, assembling, engineering and/or using the device of Carr, one necessarily further performs a method "wherein the effective surface area and interface angle are chosen to provide a net force on the valve ball (27) that offsets the increase in the spring (40) force acting on the valve ball (27) as the valve ball (27) is increasingly displaced from the valve seat (28) so that the pressure control valve has a substantially constant pressure response over a range of positions of the valve ball (27) relative to the valve seat (28)" in order to function as desired.

Regarding applicants remarks concerning the above, the argument that Carr fails to disclose any, or all three of:

> "(1) at least one surface of a valve bore with a diameter that increases non-uniformly from its upstream end adjacent the valve seat to its downstream end,
>
> (2) a valve head movable to open positions against the bias to regulate the pressure of fluid flowing downstream of the valve head, and
>
> (3) adjacent surfaces of the valve head and valve bore configured to define an interface angle between the longitudinal axis and the interface line interconnecting the point on the valve head surface closest to the valve bore surface and a point on the bore surface closest to the head

surface so that the interface angle increases as the valve head is increasingly displaced from the valve seat"

is unpersuasive in light of the disclosure of Carr.

As clearly demonstrated in figure 5 for example, the device of Carr "at least one surface (at surface 29) of a valve bore (30) with a diameter that increases non-uniformly (surface 29 is a 'smoothly curved expanding diameter surface' as disclosed at column 3, lines 65-68. Surface 20 is therefore read as a increasing 'non-uniformly' as recited in the claim); from its upstream end adjacent the valve seat to its downstream end" as pointed out in argument (1) above.

Carr also includes a "valve head (27) movable to open positions against the bias (of spring 40 and functions, in exactly the same manner as applicants device) to regulate the pressure of fluid flowing downstream of the valve head" as pointed out in argument (2) above.

Concerning argument (3) above, although Carr does not, in writing, explicitly set forth the geometric features recited in the claim, on review of the disclosure of Carr, and the fact that the ball 27 of Carr is round and inherently includes a hemispherical surface, the surface 29 of the fluid passage bore is "non-uniform" and there is no other claimed structural elements not found in Carr, there is no reason to presume that the structural elements of Carr would not include geometry in which the "interface angle between the longitudinal axis (of the bore 30, and surface 29) and the interface line interconnecting the point on the valve head (27) surface closest to the valve bore (30, 29) surface and a point on the bore (30, 39) surface closest to the head (27) surface so that the interface

angle increases as the valve head (27) is increasingly displaced from the valve seat (28)" as argued and recited in the claims.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5, 8, 11, 16 19 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carr.

The patent to Carr discloses all the claimed features with the exception of having "the valve bore is defined at least in part by a plurality of linearly tapered segments arranged so that the valve bore as a whole is not linearly tapered along its entire axial length" (claims 5, 8, 16 and 23) and "wherein the interface angle increases as the valve head is increasingly displaced from the valve seat so that the valve has a substantially constant pressure response for fluid flow rates through the valve of between about 10 liters per hour and 250 liters per hour" (claims 11and 19).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to define the valve bore section at 29 of "at least in part by a plurality of linearly tapered segments arranged so that the valve bore as a whole is not linearly tapered along its entire axial length", since it has been held that where the

general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. Here the act of defining the valve bore surface by "at least in part by a plurality of linearly tapered segments arranged so that the valve bore as a whole is not linearly tapered along its entire axial length" merely optimizes the curved surface. Moreover, it is widely recognized that an arc is nothing more than a plurality of infinitesimally small linear segments arranged so that a line drawn along the tangents forms an arc.

Additionally, to employ an "interface angle that increases as the valve head is increasingly displaced from the valve seat so that the valve has a substantially constant pressure response for fluid flow rates through the valve of between about 10 liters per hour and 250 liters per hour" is considered to be an obvious design expedient over the expanding curved surface 29 of Carr which provide no new and/or unexpected results nor solves any stated problem that the curved surface of Carr would not solve.

Regarding applicants remarks concerning the rejection under 35 USC `103(a) above, the general allegations that Carr fails to:

> "disclose applicant's basic concept of a valve which regulates the pressure of the fluid flowing through it downstream of the valve head, any construction and arrangement for doing so, much less applicant's specific construction and arrangement, nor its significant practical advantages of providing over a wide range of fluid flow rates a known pressure curve and particularly a relatively flat curve or constant pressure, a construction which is extremely economical to manufacture and assemble, can be readily mass produced, and is rugged, durable and reliable"

is unpersuasive in light of the disclosure relied on in Carr and the above conclusions in view of known practical concepts concerning optimization and desired operating conditions of the claimed device.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Rivell whose telephone number is (571) 272-4918. The examiner can normally be reached on Mon.-Thur. from 6:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Blau can be reached on (571) 272-4406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/John Rivell/
John Rivell
Primary Examiner
Art Unit 3753

j.r.